The MMSFORTH Newsletter

MILLER MICROCOMPUTER SERVICES
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A GOOD YEAR FOR FORTH (Editorial)

Pardon us for being a bit repetitious this issue! You see, this year-end issue goes to all presently-registered MMSFORTH users including those who haven't yet subscribed to the MMSFORTH Newsletter. It's our way of helping undecided users to take advantage of our learning curve and their own, and to stay with the challenge and opportunity of MMSFORTH in 1981. Subscribers already know we've been delivering your money's worth. Newcomers can look at the several issues received to see if anything might have caught their fancy - or if it will, after they subscribe. It still costs $10.00 to complete the first six issues (the first two of which were distributed free). Don't forget to mail us your check (in U.S. funds on a U.S. bank, foreigners!) along with your name, address, and MMSFORTH Serial Number.

The fabulous FORTH issue of BYTE Magazine last August helped, our improved programming and documentation helped, our attention to broadened applications programming in Forth helped, but most of all you helped - to install 1,000 MMSFORTH Systems by October 1980. We are grateful, and are pleased to be able to provide each of you with a MMSFORTH QUICK-REFERENCE CARD as a holiday present from MMS. You will find it an effective function-oriented guide through the rich vocabulary of MMSFORTH Version 1.9. You also can thank Jim Gerow and the members of the MMSFORTH Users Group of Massachusetts. With MMS they have shrunk it down bit by bit and byte by byte from their 32-page first draft, which we still fondly and wonderingly refer to as the Quick-Reference Tome!

There's just one problem with our 1,000th MMSFORTH System: it doesn't work! But that's OK, it wasn't meant to. We glued that history-making diskette to a plaque and presented it to the Forth Interest Group at its annual Forth Conference in San Mateo, California. The inscription reads, "In gratitude to the Forth Interest Group for its role in popularizing Forth, we present this 1,000th copy of the MMSFORTH System. - Miller Microcomputer Services, November 29th, 1980." While FIG will have a hard time running that thick square copy in a thin round disk drive, it can review our product on its own licensed file copy and hundreds of FIG members, of course, have bought their own. From one FIG member to another, "Thanks, guys!"

-- Dick Miller, Editor 4th Class

GET-TOGETHER

Share your questions and answers with a MMSFORTH User Group, or contact MMS for help in starting one in your metropolitan area. Here is our present list of contacts for local MMSFORTH User Groups:

CA: Earl Mortensen, 974 Pleasant Hill Road, Redwood City 94061 (415/367-9882).
CA: Ken Nonomura, 416 Duncan Street, Apt. 5, San Francisco 94131 (415/285-5062).
CA: Morris Herman, 503 Rosario Drive, Santa Barbara 93110 (805/964-7144).
CA: Rich Royea, 6456 Lubau, Woodland Hills 91367 (213/704-6859).
LA: Ed Laughery, 1222 Jason Drive, Denham Springs 70726 (504/665-7537).
MA: Jim Gerow, 1630 Worcester Road, Framingham 01701 (617/443-9521 x3562 days, 617/872-1882 eves.).
MD: Paul van der Eijk, 5480 Wisconsin Avenue #1128, Chevy Chase 20015 (301/656-2772).
MI: Kim Watt, Box 1013, Berkeley 48072 (313/288-9422).
MI: Bob Zwemer, 6408 South Washington, Lansing 48910 (517/393-9287).
TX: Larry Goforth, 10203-J Golden Meadow, Austin 78758 (512/836-0981).
TX: Jim Shepard, 16210 Arbor Downs Drive, Dallas 75248 (214/661-9702).
WA: Rod Proctor, 13520 N.E. 29th Place, Bellevue 98005 (206/885-4171 days, 206/883-1923 eves.). Rod also is on THE SOURCE.
CANADA: Kalman Fejes, 1149D Meadowlands Drive East, Ottawa, Ontario K2E 6J5 (613/225-2443).
JAPAN: Akira Akutsu, M.D., 2-176 Issha, Meito, Nagoya, 465.

NOTE: Program trading is one popular facet of these meetings, but NOT commercial programs and WITHOUT MMSFORTH SYSTEMS aboard! Promote legitimate sharing, discourage pirating, and take care not to jeopardize your own MMSFORTH serial number.

WHAT'S NEW?

MMSFORTH GAMES DISKETTE, VOLUME I:

Here's some fun for your and your friends, a brand new collection of the best we've seen in Forth games for your TRS-80! Four new games plus the classic BREAKFORTH, all with source code and in one handy place for your regular use. The newcomers include FREEWAY and CRASHFORTH, real-time action games with sound for one and two players, respectively. These are top-notch - if you liked BREAKFORTH, you'll really like these as well.

We've included two challenging board games, too. A keen version of OTHELLO challenges advanced Forth programmers to extend its decision-tree for more advanced levels of play. A variation on a theme called TICTACFORTH requires you to place five pieces in a row. Sounds familiar? Ah, but, it's on a six-by-eight grid, two to nine can play, and the pieces each count down and disappear before your very eyes if you don't move quickly enough!

Like BREAKFORTH, OTHELLO was authored by Arnold Schaeffer. CRASHFORTH, FREEWAY and TICTACFORTH are written by Dave Huntress. These regular contributors to this Newsletter expect to send more games, and we won't be surprised if you do, too! So, enjoy Volume I as we prepare for Volume II. All you need is 32K RAM, one disk drive, and your MMSFORTH System Diskette. All we need is $39.95 plus $2.00 shipping/handling.

MMSFORTH UTILITIES DISKETTE AVAILABLE NOW:

MMS has upgraded its popular Floating Point Math/Z80 Assembler diskette to include XREF and ALL-CAPS. XREF, a powerful new cross-referencing routine by Paul van der Eijk, provides ASCII-ordered listings with block and line numbers, for one word or for all words except those you list in "ignore" blocks. Serious Forth programmers should find it as invaluable as we do here at MMS!

Andy Watson's ALL-CAPS routine converts all occurences of lower-case characters to their upper-case counterparts and rewrites these throughout a range of diskette blocks. This will permit the distribution of lower-case information for the growing number of compatible users, as it offers an easy conversion process to avoid the "garbage" display of lower-case on unmodified TRS-80's.

Our new MMSFORTH UTILITIES DISKETTE is just $39.95 plus $1.00 shipping/handling. For an upgrade, send $25.00 and your original FP/Z80 diskette. (That's the usual $10.00 re-write charge, plus the $10.00 price increase, $1.00 S/H, and a $4.00 deposit in case your diskette must be replaced.)

AN EXCELLENT NEW BOOK, AND SOME GOOD OLD ONES:

Available from the MMS bookshelf is "THREADED INTERPRETIVE LANGUAGES", by Ron Loeliger. This is the first really good book we have seen on the construction of a Forth language. As a bonus, its example language ZIP is a far closer approximation to MMSFORTH than to FIGForth or to 79-STANDARD.

TIL is not the ideal book for beginners to Forth, nor is ZIP a fully-implemented Forth ready to enter into your computer. But if you are a competent programmer and can appreciate an excellently written and quite detailed description of how Forth manages to do its tricks, how it implements <BUILDS and DOES>, vocabulary branching and many of its other tools, this will be your cup of tea.

TIL is available from MMS for $18.95 plus $2.00 shipping/handling. Foreign orders include $4.00 s/h and we will refund overpayment if any.

MMS will continue to stock the CALTECH FORTH MANUAL. While we think TIL has upstaged it as the best look at Forth internals, the Caltech book still is a valuable addition to many a Forth bookshelf at its new price of $10.00.

Also on the MMS bookshelf are the following:

microFORTH PRIMER	$15.00
USING FORTH	25.00
BYTE Magazine, August 1980 (special on Forth)	4.00
FIGFORTH Implementation Manual	10.00
79-STANDARD Forth Specification Manual	10.00
URTH Tutorial Manual	19.95

(All plus shipping, Mass. orders plus 5% State Tax.)

SETTING FORTH (for beginners)

MMSFORTH ERROR MESSAGES:

In MMSFORTH, error messages are short and sweet. Most complaints echo the erring word with a question-mark; if it was being compiled from a block, the block number and line number in which it was encountered are also given. Enter that block with the EDS command to find and fix the problem. No problem? Possibly there was an improper call to load that block, out of turn. Or, your finger hit a non-printing control key which is now imbedded in the apparently normal word. To test for the latter, just key it again - carefully!

; ? is a special compilation-time complaint. It says you have entered the end-of-definition semi-colon, but Forth disagrees that you are ready for one. It sees a syntax error or an imbalance: have you forgotten the THEN for your IF, the LOOP for your DO, the PEND for your PERFORM, etc.? The ; before the next : ? Or did you run out of memory space before completing the compilation? (Enter 'S PAD - . to find out how many bytes are free.)

On the above errors, the entire definition is ignored. That means you can stop worrying about how much of the job is now compiled - everything up to but not including the CODE or : at the beginning of the erring definition.

PROTECT-DISK errors remind you to decrease the PBLK setting so you can write on the block in question. You can still complete the task after making the adjustment. READ? and WRITE? and similar messages give you bad news concerning disk/tape I/O, followed by the block number they are complaining about. Unless you asked an unreasonable question, suspect dust or a temporarily balky disk if it goes away, else your diskette, tape, or the disk drive adjustment. Testing on another compatible TRS-80 will tell you a lot.

STRINGS ATTACHED!:

Unlike most other Forth systems sold today, MMSFORTH includes a full complement of powerful string commands. These are designed to be as similar as possible to those in Radio Shack's Level II BASIC. Upon loading of Blocks 29-31, your MMSFORTH string words are ready for use in business programming or games. Here's how.

First, include the STRINGS word set by mounting your MMSFORTH System Cassette or System Diskette and then entering 29 3 LOADS . In MMSFORTH, strings - that is, actual strings of ASCII-code characters representing letters, numbers, blanks and punctuation marks - are stored as string variables ($VARIABLE), string constants ($CONSTANT), or string literals ($L). One and exactly one string can be stored as a string literal beginning at the memory location called PAD . The string variable name actually only contains a memory address, and that address is the beginning of the string itself. The string consists of a single-character number of bytes, followed by that many ASCII-coded characters of the string itself. Thus, each string can be up to 255 characters in length.

Try this example: 20 $VARIABLE EXAMPLE allots 20 bytes for a string variable named EXAMPLE. Create a string literal (in PAD) as follows: $L MMSFORTH IS GREAT!" , and store it in our new variable with: EXAMPLE $! . Now that it's there, we can call its address into the top of the User Stack (TOS) with EXAMPLE and can print it from there with $. We can find its present length with EXAMPLE LEN . and we can perform any of the other string functions on it.

Concatenation - splicing several strings together - also is easy in MMSFORTH. But don't attempt to cram both strings into PAD at once! (If you do, the second will overwrite the first, losing it.) Try the following:

```
10 $VARIABLE 1WORD   10 $VARIABLE 2WORD
$L ONE" 1WORD $!     $L TWO" 1WORD $+     2WORD $!
CR  2WORD $.  CR
```

Note that the two words are concatenated in the order they were just prior to the $+ operator.

$CONSTANT produces exactly the same sort of string that is produced by $VARIABLE - the number of characters, followed by the characters themselves. The difference is in the way you produce it. $CONSTANT will calculate the string length correctly for the initial entry which must be given at that time: $CONSTANT THREE" 3WORD does the whole job at once, whereas $VARIABLE was used to allocate the named space before filling it with a $! operation.

Building on our earlier string, EXAMPLE, analyze and try this fancy example of string handling:

```
30 $VARIABLE WORKAREA
EXAMPLE  12 LEFT$  WORKAREA $!
WORKAREA  $L A "  $+  WORKAREA $!
WORKAREA  EXAMPLE  13 5 MID$  $+  $L  "  $+  WORKAREA $!
WORKAREA  EXAMPLE  4 5 MID$  $+  WORKAREA $!
WORKAREA  EXAMPLE  1 RIGHT$  $+  WORKAREA $!
CR  WORKAREA $.  CR
```

Of course, new Forth words can be defined to handle redundant sections whenever this becomes convenient.

Our new MMSFORTH QUICK REFERENCE CARD lists the entire set of string operators provided in MMSFORTH. Each is further described in the MMSFORTH Glossary and is utilized at least once on the MMSFORTH System Diskette/Cassette or THE DATAHANDLER. Try them all, and combine them into more powerful operators for your own tasks.

MMSFORTH MODIFICATIONS

Upgrade diskettes are available to licensed users as usual, $10.00 plus $1.00 shipping/handling (foreign orders extra). Our MMSFORTH V1.9 System Diskette is well worth the upgrade from earlier versions, and V1.9 has even had a few nice improvements in the last few months. Except for recent copies, we strongly recommend new MMSFORTH Instructions at the same time, for $8.00 additional.

A very few MMSFORTH Upgrade Diskettes were recently delivered without the necessary boot sectors. If, after following the instructions on Block 78, yours fails to load or to display the V1.9 information on the first screen, please return it to MMS, properly boxed with the note, "Needs boot!" We will rewrite it properly and return it to you free of charge.

MAKING AQUICK QUICKER:

Some recent copies of Version 1.9 of the MMSFORTH System Diskette were delivered with a supposed improvement to the SORT demonstration program that backfired - luckily, without major impact. Line 11 of Block 49 should say 48 LOAD. If that is inside parentheses on your copy, remove them with your Editor. What's it all about? Well, Block 47 also calls a 48 LOAD. This seems repetitious and is particularly awkward in the tape version. After all, why have to back up the tape to perform a redundant operation?

Well, folks, there is a reason and we shouldn't have been so quick to add the "improvement". Inside look: the 48 LOAD in Block 49 is still essential in order to recompile the Quicksort routine after PARTITION has been redefined in Assembler for AQUICK. Beginners' look: if you can't follow this, don't worry. The bottom line is that AQUICK should sort 1,000 items in 3 seconds. If it's dragging, just use the Editor to remove the parenthesis from in front of 48 LOAD on Block 49.

NEW R/S ROM BOMB:

Yup, another new feature already obsolete! If you are running our V1.9 on the new TRS-80 Model I ROM (the one which starts by saying "R/S" instead of the older "RADIO SHACK"), its new "Control key" combination (Shift-Down-arrow) won't work in some cases. Tandy followed our lead and installed the same function in ROM, which would be nice except now we don't get the signal we're looking for! It doesn't affect anything except our new full-ASCII keyboard routine, and even this continues to work for the normal, keyboard-displayed characters.

We'd like a good fix for all cases, but not yet: the early Model III's have been delivered with an old-style ROM in this respect, and none of the corrected ones, with built-in Shift-Down-arrow for Control, are yet available. Since it isn't critical to modify immediately, MMS will wait out Tandy on this one.

CUSTOMIZE MAKES REPRECOMPILATION EASY:

MMSFORTH Version 1.9 introduced the CUSTOMIZE routine, a sysgen which can simplify the creation of new MMSFORTH systems. It is used by first-time MMSFORTH users to adjust the original MMSFORTH System Diskette to their particular TRS-80 disk and RAM configuration. With a little more experience, you can use it to set up MMSFORTH for other disk track configurations, to create new diskettes with different precompiled dictionaries, and to use different block allocations for the optional disk directory.

For example, let us create a new system diskette which provides the random number and graphics capabilities aboard right from the initial boot. First, use the MMSFORTH System Diskette to format a diskette for use a bit later. Then reboot the MMSFORTH system and immediately load the desired blocks with 32 LOAD 33 LOAD. If you have other routines you wish aboard, now is the time to key them in or to load them from prepared blocks.

Then, and only then, is the time to enter DIR CUSTOMIZE. The first screen feedback notifies you that the lowest possible Directory block number will be 11, because the RAM now holds too much information to be precompiled within Blocks 0-9 as on the original MMSFORTH System Diskette. Go ahead, put it on Block 11 or, if you will be adding much more later, use Block 12 to retain

expansion space. Answer the rest of the screen prompts, and swap in the formatted diskette when asked. That's it, you have a custom system diskette for your new project.

You probably will want a new Directory aboard. One easy way to create it is to copy over the two directory blocks from the system diskette, and then modify them to taste. With the original system diskette back in Drive 0, entering 10 EDS reads Block 10 into one of the screen buffers, and pressing the + key enters Block 11 into the other one. Then renumber the blocks in buffer with 11 12 COPY 10 11 COPY, and swap the new diskette into Drive 0 to FLUSH the buffer contents onto Blocks 11 and 12 of the diskette. (Note that we moved Block 11's initial contents out before overwriting it with initial Block 10's contents.) Finally, modify these original Directory blocks to taste.

One interesting special case occurs when you wish to modify the preexisting MMSFORTH system source code in original Blocks 12-24, or one or more of the blocks these call during loading. Before loading the new code, we must forget the old. Our preferred method for doing this is to rewrite the appropriate blocks on the diskette, then to enter:
HEX FORGET OCTAL 0C 0D LOADS

What happened? FORGET OCTAL drops all code entered beginning with Block 12. It is imperative to call HEX first because Forth expects to be in HEX as it reloads Block 12, and the word will have been forgotten at that point! For the same reason, the command 12 13 LOAD (i.e., LOAD 13 blocks beginning with Block 12) must be called in hex instead of decimal (0C and 0D instead of 12 and 13).

CUSTOMIZE automatically adjusts appropriate internal settings. For example, it resets the contents of the seventh byte of Track 0, Sector 0 to the number of sectors to be loaded on boot. Study the CUSTOMIZE source code on Block 68 of MMSFORTH Version 1.9 for further information of this sort.

A final thought: if you are planning to market an application program in MMSFORTH, consider doing it as we do with THE DATAHANDLER. Deliver it complete with its own Directory blocks and source code, but with empty, formatted blocks where the MMSFORTH System should be. Then provide simple instructions for the customer to boot his own MMSFORTH System, DIR and CUSTOMIZE with appropriate options, and write the resulting RAM version of MMSFORTH to your provided diskette.

PERIPHERAL TALK

PATCHING A BAD TAPE BLOCK:

As some of us know too well, tape cassette has NOT been the most reliable medium for storing TRS-80 Model I data. One or more blocks of your MMSFORTH System Cassette may have fallen victim to this problem. MMS has given you an insurance policy by duplicating the entire sixty-some blocks on the reverse side of the tape. Here is a MMSFORTH technique to get a clean reading of any block from the duplicate side and then to rewrite it.

Read the block (we'll choose Block 33 for this example) into PAD with 'PAD 33 RBLK' . Then feed in Block 33 from the tape (repeatedly if necessary) until it is read successfully; if one side doesn't work, reverse the tape or adjust the volume control, etc. If the recorder head is slightly misaligned, try leaning down on one or the other of the two front corners of the cassette body while doing the read operation.

Once the information is read in without reporting an error, wrap a bit of paper or tape over the appropriate write-protect hole on the rear edge of the cassette body. Position the tape to the beginning of the bad copy of the block by LISTing the prior block number, as '32 LIST' . Then rewrite Block 33 from the good copy in PAD with, 'PAD 33 WBLK' . Reopen the write-protect hole, and you're done!

DISK DRIVE PROBLEMS?:

MMSFORTH has been performing reliably on a thousand computers and its disk I/O operations are well within the TRS-80 hardware specifications. However, we have received reports of poor performance on a few TRS-80's and can offer a patch to increase the disk controller chip's between-commands delay and another patch to increase the delay while the disk drive motor comes up to speed. The former should not be appropriate unless your equipment is running at a higher CPU speed than normal. The second patch may be useful if your disk drive motor is a slow starter. We recommend drive maintenance instead but, except for slowing down BACKUP operations a little, the patch won't hurt and it just might help.

Boot a backup of your MMSFORTH System Diskette and enter:
HEX 50E4 6 DUMP
This should display: C5 C1 C5 C1 C5 C1 . If so, and if you wish to adjust for fast CPU operations, enter:
: X 50E4 6 0 DO E3 OVER I + C! LOOP DROP ;
X FORGET X
Now, another 50E4 6 DUMP should display: E3 E3 E3 E3 E3 E3.

The present motor start-up delay is set by the value in 5162 Hex, which has been 60 in past versions of MMSFORTH. (Enter: HEX 5162 C? to display the 60.) To out-wait a slow motor start-up, enter:
HEX 80 5162 C! (You can increase this 80 to A0, C0, etc., up to 00 if necessary.)

To rewrite the modified MMSFORTH System back to the diskette, remove the write-protect tab and enter:
DECIMAL ERASE-CORE 19200 0 0 2 40 DWTSECS . You are done, unless you want to carry this change on into precompiled applications diskettes, as well.

Let us know if these changes prove helpful. A tip of the hat to Jim Gerow of Framingham, Massachusetts and to Arne Rohde of Struer, Denmark for suggesting these fixes!

MMSFORTH QUICKIES

A BASE ACT:

Ever want to know what base your MMSFORTH number system presently is in? The first time you ask the obvious, BASE ?, you may be in for a surprise. This apparently reasonable request will return a 10 whether you are in DECIMAL, OCTAL, HEXADECIMAL or Base 2 or even Base 7! Try it and see. Then think about it until you understand why.

We find 5 5 * . to be a far more useful question to ask the computer, because its answer varies according to the present base. If you have RAM to spare for random goodies, here is a simple routine that will only return a 10 when the answer is DECIMAL, and will favor you equally with an 8 or 16 when appropriate:
: ?BASE BASE C@ DECIMAL DUP . BASE C! ;

NEW DATAHANDLER TOOL, MAKE-LAST:

One of the nicest recent additions to THE DATAHANDLER is the carry-forward ;-key feature in ADD and CHANGE. With this, instead of keying data into a field a touch of the ;-key duplicates the prior entry in the same field. Dynamite! Now, wouldn't it be nice if we could duplicate some other existing entry, not just the final one? We can! Thanks to Jill Miller at MMS, here's a short but valuable add-on to your DATAHANDLER routines.

```
: MAKE-LAST   ONE  IF IRECORD DUP  RECORD-# 1-  IRECORD DUP @
  ROT @  ROT !  SWAP !  BACK " OLD RECORD " . "  IS NOW LAST" CR
  THEN ;
```

Using this little marvel is also simple. First use LIST to locate an existing record with the information you desire to carry forward, note its record-number, enter MAKE-LAST, and answer the next prompt with that number. Then use your new last-record's information for the carry-forward operations in ADD or CHANGE, doing more MAKE-LAST moves if desired. When all your new entries are in, you can reorganize your DATAHANDLER file at lightning speed with a SORT operation .

CHECKBOOK SUMMARY FOR THE DATAHANDLER:

Getting ready for year-end accounting and then for taxes? Here's a present from DATAHANDLER author Tom Dowling to make your work easier! Insert this block within THE DATAHANDLER or after loading it, then use it on CHECKS files which you have previously sorted by payee name.

With an easy modification, you can summarize by date, etc. For this just change the two 2's on Line 11 to the date field (2 for Field 3, 6 for Field 7, etc.).

BLOCK : 93

```
 0 ( CHECKBOOK SUMMARY FOR DATAHANDLER, BY TD/MMS, 11/6/80 )
 1
 2 0 VARIABLE LCNT
 3 : SCR 1 LCNT +! LCNT @ 60 >= IF WHILE LCNT @ 67 < PERFORM
 4   CR 1 LCNT +! PEND 0 LCNT !     ELSE CR THEN ;
 5 : SHEET  0 LCNT !   0. 3 PRINTER  RECORD-# @ 0
 6   DO  I 1+ 4 .R  4 SPACES        I 0 FIELD  5 $.L 4 SPACES
 7       I 1 FIELD  8 $.L 4 SPACES  I 2 FIELD 20 $.L 4 SPACES
 8       I 3 VAL SCALE 9 RDOUT <R DROP DROP R> 4 SPACES
 9       I 4 FIELD 5 $.L 4 SPACES  I 5 FIELD 30 $.L
10       I 3 VAL SCALE <R D+ R>
11       I 2 FIELD  I 1+ 2 FIELD  $COMPARE
12       IF CR 53 SPACES 9 RDOUT DROP DROP DROP 0. 3 CR 2 LCNT +!
13       THEN SCR
14   LOOP   DROP DROP DROP  NO-PRINTER ;
15
```

AT MILLER MICROCOMPUTER SERVICES

ARTICLES COMING ON DATAHANDLER CUSTOM MODIFICATIONS:

THE DATAHANDLER, our database management system in MMSFORTH, is excellent as it is designed. With a few modifications for any given task, it can become a dream come true!

MMS is very busy customizing THE DATAHANDLER for a wide variety of clients. So far we have produced dedicated versions to do specific tasks involving professional mailing labels, inventory, payroll, order entry and sales analysis, repair logging, and more. All out-perform their BASIC counterparts (often spectacularly so!) and were delivered in less time with less expense. In one of its more versatile roles, MMS has even modified THE DATAHANDLER to replace a fleet of IBM keypunch machines with one-disk Model I's for preprocessed high-volume data entry to a minicomputer system!

Other programmers as well as MMS now provide custom installation and modification of THE DATAHANDLER. Typical prices are $500 including all software and service time for a simple system, $1,000 for a moderately complex project. At $140, MMSFORTH and THE DATAHANDLER probably offer 90% of the final job in completed and modular form. That offers a good profit for a good Forth programmer, and could offer a full- or part-time business for you. For the client it's a good price, early delivery, and a lot of user satisfaction as well.

Because so many of you have expressed interest in this as a personal or commercial activity, MMS will explain key internal words and modification procedures for THE DATAHANDLER, starting in the following issue.

THE MODEL III IS COMING ALONG FAST:

We are running a development version of MMSFORTH on disk and tape versions of the TRS-80 Model III microcomputer at this time, and hope to announce a saleable product by our next issue. Our comment at this time is that it will be compatible with our prior programming, and is becoming very nice indeed! Watch this space for further announcements.

TAPE STILL V1.8:

As of this writing, the MMSFORTH System Diskette is at Version 1.9 but the cassette version is still 1.8. Many V1.9 changes are inappropriate to the cassette format, and extensive MMS support of the tape system is limited by its lower sales volume (caused in large part by the rapid conversion of tape users to disk users). MMS plans further additions to the tape system and will keep you tape users posted as changes are implemented. (Say, can we sell you a disk drive?)

DATAHANDLER UPGRADES:

MMS has discontinued the special reduced price for upgrading THE DATAHANDLER V1.0 to V1.1 . Such upgrades now require a $5.00 documentation price in addition to the prior $10.00 for disk rewrite and $1.00 shipping/handling. As usual, include $4.00 for possible diskette replacement; we return this if we needn't use it. (Translation: send your original MMS-labelled DATAHANDLER diskette and $20.00.)

Some users say we haven't emphasized this major upgrade from V1.0 as much as it deserves. We thought we had, although our most glowing description was trimmed from a full Newsletter #3. We agree with them - upgrading THE DATAHANDLER will prove well worthwhile!

STOP MASHING THOSE DISKETTES!:

Package your diskettes carefully before shipping to us. Tight-wrapped layers of cardboard in envelopes often fail, and "Floppy Armour" doesn't always survive the stamping (and stomping?) process at the Post Office. Follow our recommendation in the MMSFORTH and DATAHANDLER instructions: seal your original MMS-labelled diskette and its diskette envelope in a baggie, then "float" it on crushed paper in a mailing box. It may be worth $4.00 to you and save us a hassle, to boot!

AND DON'T TAPE YOUR CASSETTES!:

Don't use tape to stick your cassette to a backing, etc., without first enclosing it in a box or baggie. The recording tape itself occasionally gets sticky due to careless packaging. MMS won't put such a cassette into our recorders and you shouldn't, either!

FUN & GAMES

PATTERNS:

Dave Huntress of Randolph, Massachusetts offers this briefly-coded routine to paint interesting patterns on your screen. Note the simple coding and the wide range of effects produced by minor variations.

```
BLOCK : 51

 0 ( PATTERNS PROGRAM, BY DAVE HUNTRESS, OCT.1980 )
 1 : TASK ;           33 LOAD ( GRAPHICS ROUTINES )
 2
 3 0 VARIABLE X          0 VARIABLE Y
 4 0 VARIABLE S          5 VARIABLE AD
 5 : X?   X @ 1270 >  IF 0 X !  1 S +!  THEN ;
 6 : S?   S @ 40 >    IF CLS  0 X !  1 AD +!  0 S !  THEN ;
 7
 8 : PATTERNS   CLS
 9   BEGIN  48 0 DO I X @ 10 / ESET  AD @ X +!  X?  S?
10              LOOP  47 Y !
11      BEGIN Y @ X @ 10 / ESET AD @ X +!  -1 Y +!  X? S?  Y @ 0 <
12      END  AD @ 100 >
13   END ;
14
15 PATTERNS    FORGET TASK
```

THE LAST WORD:

```
: CURSOR   ONE WHO GETS HIS DATA TRAPPED IN A 20-MINUTE  BASIC SORT
;
```

- Prof. James W. Spears, a fan of THE DATAHANDLER

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